

IN THE CLAIMS:

Claims 1-25 (Canceled)

Claim 26 (Currently Amended) A dry pipe valve sealing assembly comprising:

a seat body having a first seating surface and a second seating surface cincturing the first seating surface, the first seating surface defining a first seat body axis and the second seating surface defining a second body axis offset to the first seat body axis, the first and second seating surfaces being generally disposed on a common plane; and

a clapper being positioned to cooperate with the seat body, the clapper having a solid surface that extends from the first seating surface to the second seating surface.

Claim 27 (Original) The dry pipe valve sealing assembly of claim 26, wherein the first and second seating surfaces comprise metallic seating surfaces, and wherein the clapper supports a unitary polymeric sealing member that forms first and second sealing surfaces, the first sealing surface defining a first axis, and the second sealing surface surrounding the first sealing surface to define a second axis offset to the first axis, the first and second sealing surface being respectively contiguous to the metallic first and second seating surfaces to prevent fluid flow through the seat body.

Claim 28 (Currently Amended) A dry pipe valve sealing assembly comprising:

a seat body having first and second seating surfaces disposed on the seat body; and

a clapper positioned to cooperate with the seat body;

a unitary sealing member disposed on the clapper, the unitary sealing member including a first sealing surface engaging the first seating surface and defining a first axis, and a second sealing surface cincturing the first sealing surface to define a second axis offset to the first axis, the clapper having a solid surface that extends from the first seating surface to the second seating surface, the first and second sealing surfaces engaging the respective first and second seating surfaces to prevent fluid flow through the seat body.

Claim 29 (Original) The dry pipe valve sealing assembly of claim 28, wherein the first and second seating surfaces being generally disposed on a common plane, the first and second seating surfaces

being formed from a metallic material and the unitary sealing member being formed from a polymeric material.

Claim 30 (Currently Amended) A dry pipe valve sealing assembly comprising:

a seat body having a first metallic seating surface and a second metallic seating surface cincturing the first metallic seating surface;

a clapper positioned to cooperate with the seat body; and

a sealing member coupled to the clapper, the sealing member having first and second polymeric sealing surfaces, the first polymeric sealing surface defining a first axis and engaging the first metallic seating surface, the second polymeric sealing surface cincturing the first polymeric sealing surface to define a second axis offset from the first axis, the clapper having a solid surface that extends from from the first seating surface to the second seating surface, the second polymeric sealing surface engaging the second metallic seating surface in one position of the clapper to prevent fluid flow through the seat body.

Claim 31 (Original) The dry pipe valve sealing assembly of claim 30, wherein the first and second metallic seating surfaces being generally disposed on a common plane, the first and second polymeric sealing surfaces being formed by a unitary member.

Claim 32 (Currently Amended) The dry pipe valve sealing assembly any one of claims 27, 29, or 31, wherein at least one of the first and second sealing surfaces comprises cantilevered lips extending oblique to one of the first and second axes.

Claim 33 (Original) The dry pipe valve sealing assembly of claim 32, wherein the clapper further comprises a retainer plate sandwiching the unitary sealing member between the clapper and the retainer plate.

Claim 34 (Original) The dry pipe valve sealing assembly of claim 32, wherein the clapper defines a first distance between the pivot axis and the first axis, and a second distance between the pivot axis and the second axis such that the second distance is less than about 1.8 times the first distance.

Claims 35-41 (Canceled)

Claim 42 (Withdrawn) A fire protection system comprising:

- a supply pipe having a first fluid pressurized to a first pressure;
- a network of pipes having a plurality of sprinklers, the network of pipes having a second fluid being pressurized to a second pressure at approximately 5.5 times the first pressure; and
- a dry pipe valve including:
 - a body defining a passage extending along a longitudinal axis between an inlet coupled to the supply pipe and an outlet coupled to the network of pipes, the inlet having an inlet diameter of approximately WD inches;
 - a seat disposed in the body, the seat having a seating surface with a diameter AD approximately less than two times WD inches; and
 - a clapper pivotable about an axis orthogonal to the longitudinal axis between a first position occluding the passage when the ratio of the second pressure to the first pressure is at least 5.5 and a second position permitting fluid flow through the passage when the ratio is less than 5.5.

Claim 43 (Withdrawn) The system of claim 42, wherein WD comprises a magnitude of about six inches.

Claim 44 (Original) The system of claim 42, wherein the seating surface comprises first and second seating surfaces disposed on the body, the first seating surface disposed about the longitudinal axis, the second seating surface cincturing the first seating surface to define a seat axis offset to the longitudinal axis, the clapper having a first sealing surface disposed about the longitudinal axis and a second sealing surface cincturing the sealing surface to define a clapper axis offset to the longitudinal axis, the clapper cooperating with the seating surfaces in one position of the clapper to prevent fluid flow through the passage.

Claim 45 (Withdrawn) The system of claim 44, wherein the clapper comprises a first distance between the pivot axis and the longitudinal axis, one of the clapper and seat axes being located at a second distance to the pivot axis of less than about 1.8 times the first distance.

Claims 46-50 (Canceled)

Claim 51 (New) A dry pipe valve sealing assembly comprising:

a seat body having a first seating surface and a second seating surface cincturing the first seating surface, the first seating surface defining a first seat body axis and the second seating surface defining a second body axis offset to the first seat body axis, the first and second seating surfaces being generally disposed on a common plane, the first and second seating surfaces includes metallic seating surfaces; and

a clapper being positioned to cooperate with the seat body, the clapper supports a unitary polymeric sealing member that forms first and second sealing surfaces, the first sealing surface defining a first axis, and the second sealing surface surrounding the first sealing surface to define a second axis offset to the first axis, the first and second sealing surface being respectively contiguous to the metallic first and second seating surfaces to prevent fluid flow through the seat body, and at least one of the first and second sealing surfaces includes cantilevered lips extending oblique to one of the first and second axes.

Claim 52 (New) A dry pipe valve sealing assembly comprising:

a seat body having first and second seating surfaces disposed on the seat body, the first and second seating surfaces being generally disposed on a common plane; and

a clapper positioned to cooperate with the seat body;

a unitary sealing member disposed on the clapper, the unitary sealing member including a first sealing surface engaging the first seating surface and defining a first axis, and a second sealing surface cincturing the first sealing surface to define a second axis offset to the first axis, the first and second sealing surfaces engaging the respective first and second seating surfaces to prevent fluid flow through the seat body, the first and second seating surfaces being formed from a metallic material and the unitary sealing member being formed from a polymeric material, and at least one of the first and second sealing surfaces includes cantilevered lips extending oblique to one of the first and second axes.

Claim 53 (New) A dry pipe valve sealing assembly comprising:

a seat body having a first metallic seating surface and a second metallic seating surface cincturing the first metallic seating surface, the first and second metallic seating surfaces being generally disposed on a common plane;

a clapper positioned to cooperate with the seat body; and

a sealing member having first and second polymeric sealing surfaces, the first polymeric sealing surface defining a first axis and engaging the first metallic seating surface, the second polymeric sealing surface cincturing the first polymeric sealing surface to define a second axis offset from the first axis, the second polymeric sealing surface engaging the second metallic seating surface in one position of the clapper to prevent fluid flow through the seat body, the first and second polymeric sealing surfaces being formed by a unitary member, and at least one of the first and second sealing surfaces including cantilevered lips extending oblique to one of the first and second axes.

Claim 54 (New) The dry pipe valve sealing assembly of any one of claims 51-53, wherein the clapper further comprises a retainer plate sandwiching the unitary sealing member between the clapper and the retainer plate.

Claim 55 (New) The dry pipe valve sealing assembly of any one of claims 51-53, wherein the clapper defines a first distance between the pivot axis and the first axis, and a second distance between the pivot axis and the second axis such that the second distance is less than about 1.8 times the first distance.

Claim 56 (New) A dry pipe valve sealing assembly comprising:

a seat body having a first seating surface and a second seating surface cincturing the first seating surface, the first seating surface defining a first seat body axis and the second seating surface defining a second body axis offset to the first seat body axis; and

a clapper being positioned to cooperate with the seat body, the clapper supports a polymeric sealing member that forms first and second sealing surfaces, the first sealing surface defining a first axis, and the second sealing surface surrounding the first sealing surface to define a second axis offset to the first axis, the first and second sealing surface being respectively contiguous to the first

and second seating surfaces in one position of the clapper to prevent fluid flow through the seat body, the clapper having a solid surface that extends between the first and the second seating surfaces.

Claim 57 (New) The dry pipe valve sealing assembly of claim 56, wherein the clapper further comprises a retainer plate sandwiching the unitary sealing member between the clapper and the retainer plate.

Claim 58 (New) The dry pipe valve sealing assembly of claim 56, wherein the clapper defines a first distance between the pivot axis and the first axis, and a second distance between the pivot axis and the second axis such that the second distance is less than about 1.8 times the first distance.

Claim 59 (New) The dry pipe valve sealing assembly of any one of claims 28 and 56, wherein the first and second sealing surfaces are spaced apart from the first and second seating surfaces at another position of the clapper to permit fluid flow through the seat body.

Claim 60 (New) The dry pipe valve sealing assembly of any one of claims 26, 28, or 30, wherein the solid surface of the clapper and the seat body form a chamber.

Claim 61 (New) The dry pipe valve sealing assembly of claim 60, wherein the chamber comprises a recessed surface formed between the first and second seating surfaces.

Claim 62 (New) The dry pipe valve sealing assembly of claim 61, wherein the chamber comprises at least a recessed surface of the seat body that circumscribes the first seating surface of the seat body.

Claim 63 (New) The dry pipe valve sealing assembly of claim 62, wherein seat body comprises a drain port in communication with the chamber.

Claim 64 (New) The dry pipe valve sealing assembly of any one of claims 51, 52, 53, or 56, wherein the clapper comprises a solid surface that extends between the first and second seating surfaces.

Claim 65 (New) The dry pipe valve sealing assembly of claim 64, wherein the solid surface of the clapper and the seat body comprises a chamber.

Claim 66 (New) The dry pipe valve sealing assembly of claim 65, wherein the chamber comprises a recessed surface formed between the first and second seating surfaces.

Claim 67 (New) The dry pipe valve sealing assembly of claim 66, wherein the chamber comprises at least a recessed surface of the seat body that circumscribes the first seating surface of the seat body.

Claim 68 (New) The dry pipe valve sealing assembly of claim 67, wherein seat body comprises a drain port in communication with the chamber.

Claim 69 (New) The dry pipe valve sealing assembly of any one of claims 51, 52, 53, or 56, wherein at least one of the first and second sealing surface comprises cantilevered lips extending oblique to one of the first and second axes.

Claim 70 (New) A dry pipe valve comprising a housing enclosing the dry pipe valve sealing assembly of claim 26.

Claim 71 (New) A dry pipe valve comprising a housing enclosing the dry pipe valve sealing assembly of claim 28.

Claim 72 (New) A dry pipe valve comprising a housing enclosing the dry pipe valve sealing assembly of claim 30.

Claim 73 (New) A dry pipe valve comprising a housing enclosing the dry pipe valve sealing assembly of claim 32.

Claim 74 (New) A dry pipe valve comprising a housing enclosing the dry pipe valve sealing assembly of claim 56.

Claim 75 (New) A dry pipe valve comprising a housing enclosing the dry pipe valve sealing assembly of claim 56.

Claim 76 (New) A fire protection system comprising:

- a supply pipe having a first fluid pressurized to a first pressure;
- a network of pipes having a plurality of sprinklers, the network of pipes having a second fluid being pressurized to a second pressure at approximately 5.5 times the first pressure;
- a housing defining a passage extending along a longitudinal axis between an inlet coupled to the supply pipe and an outlet coupled to a network of pipes, the inlet having an inlet diameter of approximately WD inches;
- a seat body disposed in the housing, the seat body having a seating surface with a diameter AD approximately less than two times WD inches and including a first seating surface and a second seating surface cincturing the first seating surface, the first seating surface defining a first seat body axis and the second seating surface defining a second body axis offset to the first seat body axis, the first and second seating surfaces being generally disposed on a common plane, the first and second seating surfaces include metallic seating surfaces; and
- a clapper being positioned to cooperate with the seat body and pivotable about an axis orthogonal to the longitudinal axis between a first position occluding the passage when a ratio of the second pressure to the first pressure is at least 5.5 and a second position permitting fluid flow through the passage when the ratio is less than 5.5, the clapper having first and second sealing surfaces, the first sealing surface defining a first axis, and the second sealing surface surrounding the first sealing surface to define a second axis offset to the first axis, the first and second sealing surfaces being respectively contiguous to the metallic first and second seating surfaces in one position of the clapper to prevent fluid flow through the seat body, the clapper having a solid surface extending between the first and second seating surfaces of the seat body.

Claim 77 (New) The system of claim 76, wherein at least one of the first and second sealing surface includes cantilevered lips extending oblique to one of the first and second axes.

Claim 78 (New) The dry pipe valve sealing assembly of claim 76, wherein the solid surface of the clapper and the seat body comprises a chamber.

Claim 79 (New) The dry pipe valve sealing assembly of claim 78, wherein the chamber comprises a recessed surface formed between the first and second seating surfaces.

Claim 80 (New) The dry pipe valve sealing assembly of claim 79, wherein the chamber comprises at least a recessed surface of the seat body that circumscribes the first seating surface of the seat body.

Claim 81 (New) The dry pipe valve sealing assembly of claim 80, wherein seat body comprises a drain port in communication with the chamber.

Claim 82 (New) The system of claim 81, wherein the first and second sealing surfaces are spaced apart from the first and second seating surfaces at another position of the clapper to permit fluid to flow through the seat body.

Claim 83 (New) A method of operating a dry pipe valve, the dry pipe valve having a body with a passage extending along a longitudinal axis between an inlet and an outlet, a member pivotable about an axis between a first position occluding a flow of fluid through the passage and a second position permitting the flow of fluid through the passage, the member having a first operative side and a second operative side, the method comprising:

 providing a seat body having a first and second seating surfaces offset to each other;

 applying a first fluid pressure to the first operative side having a first effective surface area and a second fluid pressure to the second operative side offset to the first effective surface area and having a second effective surface area less than five times the first effective surface area to inhibit

fluid flow through the passage, the second operative side having a solid surface that extends from the first seating surface to the second seating surface; and

changing one of the first and second fluid pressures so that the member pivots from the first position toward the second position to permit fluid flow through the passage.

Claim 84 (New) The method of claim 83, wherein the applying comprises supplying the first fluid pressure to a water supply and the second fluid pressure to a plurality of unactuated sprinklers.

Claim 85 (New) The method of claim 83, wherein the applying comprises supplying pressurized fluid to the second effective area of approximately three times the first effective area.

Claim 86 (New) The method of claim 83, wherein the changing comprises at least one of increasing the first pressure and decreasing the second pressure such that the ratio of the second pressure to the first pressure is less than approximately 5.5.

Claim 87 (New) The method of claim 83 wherein the applying comprises providing a seal having first and second sealing surfaces, each of the sealing surfaces including a cantilevered lip.

Claim 88 (New) A dry pipe valve sealing assembly comprising:

a seat body having a first seating surface and a second seating surface cincturing the first seating surface, the first seating surface defining a passage having a first seat body axis and the second seating surface defining a second body axis offset to the first seat body axis; and

a member that pivots about an axis between a first position to occlude a flow of fluid through the passage and a second position to permit a flow of fluid through the passage, the member having a first operative side having a first effective surface area and a second operative side having a second effective surface area less than five times a first effective surface area of the first operative side to occlude fluid flow through the passage, the second effective surface area having a solid surface that extends between the first and second seating surfaces.